

SCB: Plasma Generator for Ignition of Explosives

The possible uses to U.S. industry for a tiny device that precisely ignites explosives a thousand times faster than conventional "hot wires" can set the imagination ablaze. The device could be used to set off air bags in automobiles, collapse old buildings in congested urban areas, fracture rock along a desired contour in mining and prospecting operations, blast irrigation and drainage ditches, drive cable and wire cutters, and ignite fancier-than-ever strings of fireworks displays.

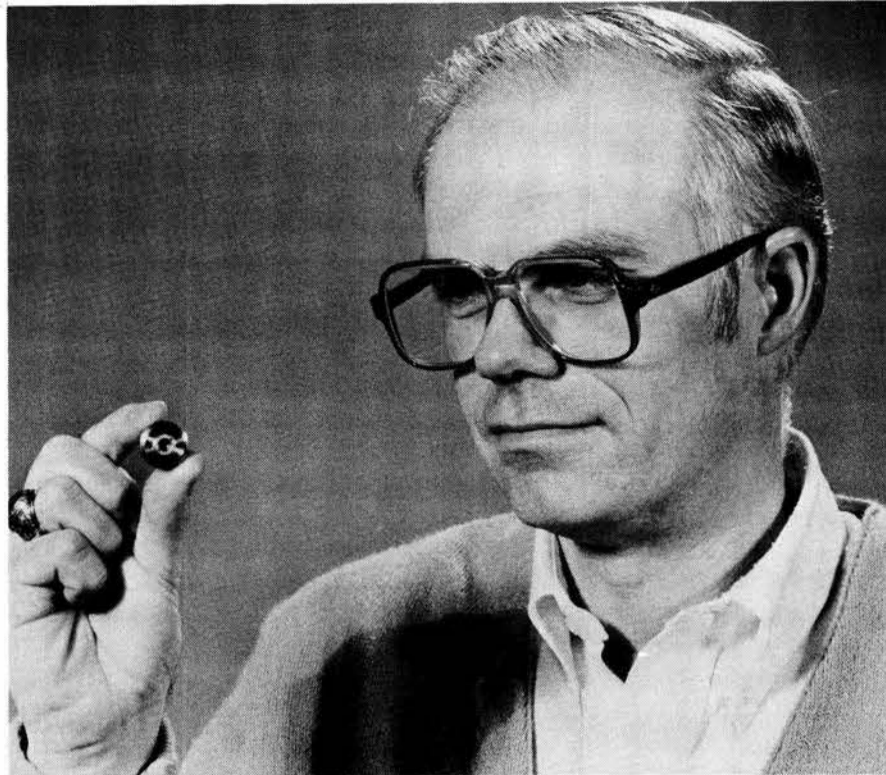
The foundation for such a device is the semiconductor bridge (SCB), developed at Sandia by Bob Bickes Jr. (2515) and Al Schwarz (ret.) and first fabricated at UNM's Center for High-Technology Materials. SCB prototypes were designed in Sandia's Initiating and Pyrotechnic Components Division 2515, supervised by Paul Wilcox, primarily for setting off small charges that actuate a number of functions in weapons.

Bridge to Next Generation?

"The SCB probably will be used first in select defense and space hardware," says Paul. The latter application could be in controlling the course of space vehicles.

"Yet I predict that American industry will pick up on the SCB for military use and ultimately spin it off for commercial use," says David Anderson, manager of Explosive Components Department 2510. "Although we developed the bridge for the weapons program, it has a lot of potential all around. The SCB may eventually lead to the next generation of explosive devices around the world. That's because it's faster, cheaper, simpler, and more capable than its predecessor, the 'hot wire.' "

According to Paul, other features that an SCB device has for both defense and commercial applications include sensitivity to a low-energy input (it takes



LARGER THAN USUAL for convenience in handling, a development test fixture is held by Bob Bickes (2515). The SCB chip is mounted (well inside the central opening) on a ceramic header; the explosive powder would go on top of it. (The leads, invisible here, are on the back of the device.) A smart component, also developed at Sandia, is about the (school-ring) size of that test fixture.

little power) but also insensitivity to static electricity and subthreshold current (it's not likely to go off accidentally), compatibility with digital circuitry (it allows precise timing), and microminiature size (see "How the Igniter Operates").

'Brains' in Thumb-Size Package

The SCB plus firing set — a box consisting of a power supply (such as a 20-gram thermal battery), a low-voltage capacitor discharge unit, and a very fast switch that triggers the SCB — is the building block for other explosive devices. The SCB requires only about 20 volts, a very low input when compared to the kilovolt requirement for exploding bridge-wire devices. In fact, its low voltage requirement

would allow an air bag system to be run off a car's battery (rather than having to install a separate power supply).

Because an SCB firing set is compatible with digital microcircuitry, it can be made into a 'smart' module. That means hooking it up with logic and/or delay timing systems (a smart SCB firing set and logic circuits were designed by Kevin Marbach, now 9212, and Pablo Garcia, 2364).

The all-in-one unit needs only three input leads: power, ground, and code/timing. Smart SCB units can come in small — thumb-size — packages: less than 25 millimetres in diameter and length.

Yet the capabilities of this mighty mite are
(Continued on Page Five)

Fund for Slain Officer

A fund has been set up at the Credit Union for Sandians who would like to contribute to the family of slain police officer John Carrillo. Bring or mail contributions to the Credit Union in care of the "Fund for the Officer Carrillo Family."

Laser is Exciting Device

Sandian Advances Semiconductor Science

Currently, silicon semiconductors are the mainstay of the microprocessor industry, with tiny (1/4-in.-sq.) silicon semiconductor chips widely used in personal computers and other devices. However, we are nearing the limits of the physical capabilities of silicon, and research into new semiconductor materials is expanding.

As these materials are developed for the computer industry, and as features are packed more densely onto chips, the process of etching features onto semiconductors becomes increasingly important and correspondingly difficult, at least by traditional methods.

A new technique developed by Carol Ashby (1126) appears to be a step toward improved etching of new semiconductors. She received a DOE Basic Energy Sciences Award in 1986 for her development of new procedures for etching semiconductors utilizing electronic properties of the materials.

Some of the most promising of the new semiconductor materials are III-V compounds, such as GaAs (gallium arsenide) and Ga(As,P) (gallium ar-

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CAROL ASHBY (1126) adjusts the mounting fixture that holds samples of semiconductor materials ready for etching by a laser beam. Carol has used tunable dye lasers to achieve the right wavelengths for etching specific materials.

Antojitos

Auf Wiedersehen, Joe One of Sandia's more colorful long-timers retired last week "after 40 years, six months, one week, and 14 VWs," to use his words. He's Joe Muench (formerly 7222), and he thought when he got hired in 1946 (after seeing a sign saying "Engineers Wanted" in the window of a storefront recruiting office in the Santa Fe Plaza) that he was going to Los Alamos. But a week before his sign-in date, LASL told him to report to its Z Division at Sandia Base in Albuquerque. He's been here ever since, first living in Base housing (furnished, utilities paid, at 10 percent of his salary), later in an old adobe (formerly a general store/post office) in Placitas -- hence the 14 VWs.

Joe was once in a division he wanted out of, thanks to being reclassified to a sub-staff level -- and not being told about it for three months. But to his then-boss, an old-time company man, transfers were an insult -- no way Joe was going to leave his group. Joe retaliated -- took a taxi from home to airport and back at \$75 each way. That did it.

Since 1958, Joe's been in weapon reliability, and he's one of the people who have brought the weapons program to the point of reliability that it enjoys today. Joe's proud of that.

* * *

P.S. Joe hired in on Aug. 12, 1946, which, as of his retirement date, made him seventh in terms of Sandia longevity. For the record, Bill Thomas (7251) hired in on June 13, 1945; then, in 1946, came Howard Austin (7126) on March 4, Billy Hickerson (5122) on March 19 (he's retiring tomorrow), Mike Michnovicz (2833) on March 25 (vintage month, March 1946!), Ed Harley (6227) on June 10, and G. C. Hollowwa (3411) on July 16. Collectively, those seven employees account for almost 287 years of service. And they -- along with the recent Miss USA contest -- are the inspiration for my choosing the quotation at the end of this column.

* * *

Speaking of the Miss USA Contest -- LAB NEWS photog Gerse Martinez had to use some vacation time recently. He was one of the very few local photographers chosen to cover the two-week-long series of events that led to the crowning of Miss USA here last week. Even so, next time he's posing you for a shot, don't expect him to make you look like any of them. (We've tried to avoid it here, but the Journal got a bit caught up in the pageantry: In describing the future plans of Miss New Mexico, Kriston Killgore, the paper noted that she plans "to continue her studies in broadcasting at the University of Miss New Mexico.") ●BH

* * *

Nature makes boys and girls lovely to look upon so they can be tolerated until they acquire some sense. -- Wm. Lyon Phelps

(Continued from Page One)

New Semiconductor Technique

senide phosphide). These materials can be used in high-speed, high-temperature, and radiation-hard applications. (III-V compounds are named for the groups in the periodic table in which the elements of the compounds appear. As a class, several of these

compounds may be useful as semiconductors.)

Several of the processes for preparing GaAs-based devices permit the creation of layered samples, each layer with different levels of impurity doping or with different ratios of arsenic to phosphorus. Although the layers are very similar chemically, they have different electronic properties, and Carol has demonstrated that these differences can be exploited to etch features selectively into the layered GaAs and Ga(As,P) samples.

Laser Excites Electrons

Ga(As,P) materials of different composition were grown by Bob Biefeld (1144). Then Carol applied a laser beam to the samples to etch holes in material of one composition, but not another. The laser did not burn the holes, but rather excited electrons in one semiconductor material so that the electrons were forced to cross the bandgap (the difference in energy between the valence and conduction bands of the semiconducting solid).

Carol achieved the appropriate excitation energy by selecting the wavelength of the laser light needed to excite the electrons in one composition of Ga(As,P). When the excited material is exposed to chlorine gas, the carriers (electrons and holes created by laser excitation) drive a chemical reaction between the chlorine and the semiconductor to create volatile products. As these volatile products evaporate from the surface of the semiconductor, they create etched features only where the laser light was originally absorbed.

For Special Cases Only

New Deal on Consulting

Small Staff decided last week to allow Sandia employees, on a case-by-case basis, to spend up to 208 hours a year -- above and beyond normal job duties at Sandia -- on certain types of for-profit consulting for U.S. industry or state or local government.

"The out-of-hours consulting option, which will be limited to the area of Labs-developed technologies, is a new tool available to Sandia for enhancing tech transfer," says Glenn Kuswa, manager of Technology Transfer and Management Department 4030.

Management Tool for Tech Transfer

"The new policy doesn't automatically apply to all individuals who wish to consult outside Sandia," Glenn continues. "In fact, consulting arrangements will require prior approval by line management through the VP and a review by the Conflict of Interest Committee. The idea is to permit consulting selectively, when it clearly furthers Sandia's tech transfer goals and when it wouldn't interfere with the employee's primary obligations to Sandia or with Labs activities."

Approval of any consulting agreement will be limited to one year with possible renewal. The 208-hour allowance is equivalent to one full day every two weeks.

An alternative -- and continuing -- option for enhancing tech transfer is for Sandia to assign employees (on Sandia time) to take on functions for outside organizations that amount to consulting. This category includes providing advice or performing specified tasks.

Labs' Ideas, Products

The policy change was prompted by top management's perception that the U.S. needs to improve its industrial competitiveness. The transfer of technical ideas and products devised at Sandia is an important contribution in helping domestic industry regain or retain the ability to compete. Also, on the regional level, "a number of local industries and governmental organizations have asked Sandia for help," says Glenn, "which has been difficult to render under our old policy."

The consulting provision is a first at Sandia, but not at other national laboratories (see "State of the Labs," LAB NEWS, Feb. 13, 1987). "At our sister labs, the policies on consulting arrangements are fairly liberal," says Glenn. "Sandia's policy is deliberately more conservative."

The Feb. 17 decision revises a guideline in SLI 4890 (Oct. 24, 1986), which generally prohibits technical consulting. A new SLI on tech transfer is being prepared.

According to Carol, the process has commercial application potential. "In fact, United Technologies has already used the principles of selective bandgap etching to etch gallium arsenide off an aluminum gallium arsenide substrate," Carol says. "This development was based directly on work done at Sandia."

Using material grown by Ralph Dawson (1144), Carol has also developed a method for suppressing etching in semiconductor materials. She has produced barriers to hole migration to the surface by applying negative potential to the material. This approach would be useful for selective etching of both elemental and compound semiconductor materials.

Carol's BES award was for work with "Significant Implication for Department of Energy-Related Technologies." "Her work increases Sandia's ability to fabricate special microelectronic circuits in III-V materials," says Wayne Johnson (supervisor of 1126), "and these fabrication techniques improve the possibility of fully utilizing these materials for both military and industrial applications." ●BG

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Moldable, Recyclable Foam Fits Odd-Shaped Spaces

A new type of moldable foam that, when cured, prolongs the life of electronic components — by keeping them dry and holding them in place — has been developed by Chuck Frost of Exploratory Chemistry Division 8315.

The new material, known as molded desiccant foam, is designed for protecting parts in weapon systems. However, the foam's five features — trapping water vapor and gases, being formable into solid shapes, remaining stable at high temperatures, being packable into a small volume, and providing support for weak structures nearby — may make it widely adaptable for video and audio equipment, as well as for other electronic and automotive components, according to Chuck.

That's because "moisture is a problem with practically everything electronic," he says. "And the foam's real potential is as a dual-purpose material. It combines the advantages of desiccants [agents that attract and hold moisture] and rigid foams [cellular materials that can be shaped or that support components]."

The foam is made of polyurethane resins (as a binder) and a zeolite powder (as a filler). It's similar to other chemical desiccants in function and in source (the fillers occur naturally as aluminum silicate minerals). One common example of a desiccant is silica gel, a white powder or crystal often found in teabag-sized envelopes that are packed with newly purchased cameras.

Usable When Wet, Dry

Yet, the foam is different from other desiccants. It's formulated as a thick, creamy fluid and cured to a dry, rigid foam.

While it's still fluid, the foam can easily be formed into precise shapes, including intricate forms for fitting into odd-shaped spaces. That's done by injecting the foam into a mold right after it's mixed. As a thick fluid, it also has strong adhesive properties when molded directly into a part, according to senior technician Patrick Keifer (8315).

The foam is cured by baking it in a vacuum oven (for about three hours at 350 degrees F). Baking hardens the shapes and "activates" the foam — by getting rid of any moisture picked up during processing. The permanent shapes then can provide structural support for other solids.

The foam can be tailored — by varying the amount of the zeolite filler from 10 to 60 percent of the mixture's weight — to give it a range of drying capabilities. Chuck's standard formula uses equal weights of resin and zeolite to make a foam that traps moisture weighing up to 15 percent of dry foam weight. And using more zeolite (by weight) increases desiccation by up to 18 percent (of dry foam weight), according to Patrick.

The standard-formula foam traps not only water vapor but also vapors of other liquids. In general, the foam works by adsorption, rather like an adhesive (and partly by absorption, which has a sponge-like effect). It attracts vapor to the millions of tiny pores in the zeolite powder that is dispersed throughout the cells of the foam. The vapor readily penetrates the outside of the foam and migrates to the inside where the zeolite traps it.

Chuck's standard formula allows the foam to adsorb vapors from liquids having low molecular weights. But again, tailoring — this time by changing the zeolite type — can provide a larger pore size and so adsorb gases with larger molecular weights (such as gas molecules up to about 10 angstroms in diameter).

Finally, the foam can be recycled. If it becomes saturated with water, it can be removed from its place of use and "reactivated" in a vacuum oven.

Denser Than Other Foams

Molded desiccant foam is also different from another relative, rigid polyurethane foam, typically used in thermal insulation, laminated core structures, or molded furniture. Those foams weigh from two to 20 pounds per cubic foot (pcf). But a higher density is needed for electronics applications, including weapons, that require packing foam into the smallest possible volume. So Chuck and Patrick have adjusted the formula for molded desiccant foam to attain 50 pcf after curing.

As a foam, the new material has some additional advantages. Compared to either a control foam — having the same composition but without the desiccant — or to most common polyurethane foams, the 50-pounder can withstand twice as much pressure, even when exposed to high temperatures. Also, it can take temperatures almost 100 degrees F higher without losing shape.

The molded foam may depart even further from common polyurethane foams in the future. Chuck has already formulated and tested a flexible variety of the foam. "Its flexibility may make it useful as both a desiccant and a shock absorber," he says.

A patent has been issued, and it appears that the new foam could be made in large quantities with existing commercial (foam-making) machinery. A few modifications in the formula and the mixing techniques (to make the foam flow more easily) are all that would be required. Otherwise, the ingredients, equipment, and manufacturing process are all commonly available. • ID/Larry Perrine (3161)



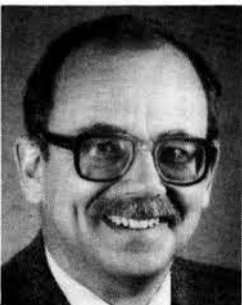
CONCAVE COLLAR was shaped, quite intentionally, with an opening on the (left) side, from molded desiccant foam, as displayed by foam developer Chuck Frost (right) and senior technician Patrick Keifer (both 8315). The new foam acts as both a drying agent and a structural support for electronic components. The tapered cylinder, rounded cap, and other wedge shapes (below) were molded from the same material.



SANDIA
LIVERMORE NEWS

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Supervisory Appointments

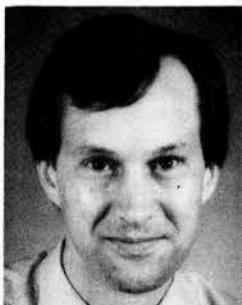


MIKE ROGERS to supervisor of Advanced Electronics Division 8432, effective Feb. 1.

Mike started as a technician at Sandia Livermore in 1963, first working on product tester design. His work over the years includes non-destructive testing, roll control system design for the B77, flight test unit design work in the W84 project group, and his most recent assignment—the SDI group.

Before joining Sandia, Mike completed a two-year technical program at Cogswell College in San Francisco. In 1972 he earned a BS in EE from San Jose State University and became a TSA. He then earned an MS in the same field from UC Davis through Sandia's Educational Aids Program and was promoted to MTS in 1976.

Mike and his wife Nancy live in Livermore. They have two daughters in college, one at UC Riverside and the other at Chico State University. Mike's outside interests include skiing and bicycling (he has biked to work much of the time for 15 years).



BRUCE DALE to supervisor of Computer Operations Division 8236, effective Feb. 1.

Bruce joined Sandia in 1976 at Albuquerque. He has served as a contract auditor, EDP auditor, and project leader in the Data Processing Applications Department. In 1984 he transferred to Sandia Livermore where he participated in administrative and planning activities of the Computation Department, including a temporary assignment to DOE Headquarters Office of ADP Management last year.

His education includes a BA from Principia College near St. Louis, and an MBA in accounting from Golden Gate University, San Francisco. While in California, he worked in public accounting and for Accountants for the Public Interest; he passed the CPA examination in 1975.

Bruce and his wife Patricia live in Modesto and enjoy cycling and other outdoor activities.

Catching Cats with FeLV



Quick, think of something mean to say to your cat. Scientists have found that the tears of a cat can be used to diagnose feline leukemia virus (FeLV). While the tear method is not as accurate as a blood test, it is a good alternative for owners who would otherwise not test their animals.

Science News

Supervisory Appointments

RON GLASER to supervisor of Systems Development Division 5256, effective Dec. 16.

Ron joined Sandia in September 1986 after working 12 years in the Satellite Sensor and Nuclear Security Systems organizations while on loan from Western Electric (now AT&T Technologies). He previously worked at Bell Labs as a Safeguard ABM systems engineer. Currently, his work is in the mobile command, control, communications, and intelligence (C³I) systems area.

Ron has a BS and MS in EE from Rensselaer Polytechnic Institute, Troy, N.Y. He is a member of IEEE and the National Society of Professional Engineers, and holds a New Mexico Professional Engineering license.

Ron enjoys camping and gardening in his spare time. He and his wife Roberta have two children and live in the SE Heights.

RAY LEEPER to supervisor of Diagnostics Division 1234, effective Nov. 16.

Ray joined the Labs in March 1976 as a member of the Electron Beam Physics Division. He has remained in the Pulsed Power Sciences Directorate, working in radiation and intense-ion-beam diagnostics.

Ray has a BS in physics from MIT and a PhD in elementary particle physics from Iowa State University. He is a member of the American Physical Society.

Ray enjoys traveling and skiing in his spare time. He and his wife Sumiko have one son and live in the NE Heights.

DAVE GARTLING (DMTS) to supervisor of Fluid Mechanics and Heat Transfer Division 1511, effective Dec. 16.

Dave joined Sandia in November 1974 as a member of the Heat Transfer and Criteria Division. He has been with this organization through its various name and organizational changes ever since. Dave's work has been centered on finite element code development, with time also spent in fluid mechanics/heat transfer analyses in support of energy and weapons projects.

Dave has a BS, MS, and PhD in aerospace engineering, all from the University of Texas. Before earning his PhD, Dave spent a year at the Von Karman Institute for Fluid Dynamics, Brussels, Belgium, in the diploma course on experimental fluid dynamics. He spent 1981 as a Fulbright Fellow at the University of Sydney (Australia) where he worked on computer codes for non-Newtonian flows.

Dave is a member of the American Society of Mechanical Engineers and the Society of Rheology. Sports cars and basketball occupy his spare time. Dave and his wife Laura (1000) have one daughter and live in the NE Heights.

PAT EICKER to manager of Computer Sciences Department 1410, effective December 16.

Pat joined Sandia Livermore in October 1969 as a member of the Systems Studies organization. He was appointed supervisor of the Energy Systems Studies Division in November 1976. In 1980, Pat moved to Heliostat Development Division 8451 and then joined Solar Program Division 8431 in 1981. Pat came to Albuquerque in October 1982 as a member of Future Options Group 301. He was supervisor of Intelligent Machine Principles Division 1411 from 1985 until his promotion.

Pat has a BS in math from Regis College in Denver, an MS in applied math from the University of Colorado, and a PhD in mathematical statistics from Colorado State University.

In his spare time, Pat enjoys skiing and hiking. He and his wife Mary Ann have two children and live in the NE Heights.



RON GLASER (5256), RAY LEEPER (1234), DAVE GARTLING (1511), and PAT EICKER (1410)

Events Calendar

Feb. 27-28— "La Bohème," by Giacomo Puccini; Albuquerque Opera Theatre/Opera Southwest production of a tale of love, jealousy, and youthful exuberance; 8 p.m. (2 p.m. Sun.), KiMo Theatre, 243-0591 or 243-8492.

Feb. 27-28— "Top of the Charts: The Big Bands," a Big Band dance with featured vocalists and sights and sounds of the times, presented by Carlaw Enterprises; 7:30 p.m., Ramada Classic Hotel Ballroom, 292-5363.

Feb. 27-March 1— "Today's Maya," an exhibition of photos by Jose Kuri Brena; 8 a.m.-5 p.m., KiMo Gallery, 848-1370.

Feb. 27-March 1— Film Festival About the Arts: fiction films on painting, theatre, dance, music, and opera; 3 p.m. Sundays, Rodey Theatre, 277-7312.

Feb. 27-March 15— "As Is," story by William Hoffman about a young man dying of AIDS; 8 p.m., Vortex Theatre (Central & Buena Vista), 247-8600.

Feb. 27-March 15— "The Hasty Heart," drama by John Patrick about a wounded Scottish soldier who rejects offers of friendship from his hospital wardmates; 8 p.m. Tues.-Fri., 6 & 9 p.m. Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Feb. 27-March 29— Exhibit, "Flat Roofs and Pointed Arches: John Gaw Meem and The Architecture of Tradition"; upper gallery, UNM Art Museum, 277-4001.

Feb. 27-March 29— Exhibit, "Drawing: Six Approaches," a look at drawings by six New Mexico contemporary artists; Jonson Gallery, 277-4967.

Feb. 27-March 29— Exhibit: Focus on Faculty series, new work by Basia Irland, UNM associate professor of sculpture; west gallery, UNM Art Museum, 277-4001.

Feb. 27-July 31— Exhibit, "Maya: The Image from the Western World"; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; main gallery, Maxwell Museum of Anthropology, 277-4404.

Feb. 28— Showtime at the KiMo: Music, Music series — musical/visual experience, Tom McVeety playing original compositions on an electric cello; 8 p.m., KiMo Theatre, 848-1374.

Feb. 28-March 24— Exhibit, Indian Artists of Indian America (IAIA) showing of mixed media art by student artists, 9 a.m.-5:30 p.m., Indian Pueblo Cultural Center, 843-7270.

March 1— Fine Arts Music Series: The King's Singers, close-harmony singing by troupe from England; 4 p.m., First United Methodist Church (4th & Lead), 243-5646.

March 3— "Mike and Else in Concert with Mari and Kirsten," Norwegian folksongs, children's and Scandinavian dialect songs; 7:30 p.m., Highland High School Performing Arts Center.

March 4-15— "Who's Afraid of Virginia Woolf?"; New Mexico Repertory Theatre performance of Edward Albee play; 8 p.m. Tues.-Sat., 2 p.m. matinees Sat. & Sun.; KiMo Theatre, 243-4500.

March 6-7— Concert, New Mexico Symphony Orchestra: New Mexico premiere of "Chetro Keti," an excerpt from Marc Neikrug's opera-in-progress entitled "Los Alamos"; and guest artist Toby Appel playing Walton's "Concerto for Viola and Orchestra"; 8:15 p.m., Popejoy Hall, 842-8565.

March 10— Central New Mexico Audubon Society Nature & Wildlife Film Series: "North to the Top of the World," presented and narrated by John Wilson; 7:30 p.m., Popejoy Hall, 881-9387 or 255-0307.

March 13-14— "Premieres and Encores," Southwest Ballet performing several ballets, old and new; 8:15 p.m., Rodey Theatre (UNM), 294-1423.

Welcome

Albuquerque

Greg Anderson (7813)
Rita Bushmire (22-2)
Douglas Cotter (7531)
Cathy Gamblin (3426)
Yolanda Mareno (21-1)
Everett Schnetzer (9133)
Douglas Wilfon (7813)

Arizona

Biu So (7261)
Dale Brandt (1126)

Connecticut

Ahmed Badruzzaman (2321)

Georgia

Stephen Attaway (1521)

Louisiana

Ramona Myers (7472)

New Mexico

Kenneth Chavez (1552)
Charles Pace (7241)
James Pacheco (6226)
Vicente Romero (1513)

Ohio

Barbara Lammie (1113)

Oklahoma

Paul Padgett (6417)

Congratulations

To Georgia (2800) and John (5161) Gronager, a daughter, Allesandra Candice, Jan. 28.

To Lenore and Ron (1221) Kaye, a son, Sheldon Philip, Feb. 6.

(Continued from Page One)

SCB Device

great: Large numbers of SCBs can be fired in sequence — as defined (and often coded) by a digital logic network. (Coded signals, for example, could be used for security reasons to deter unauthorized firing.)

And so it's the controllability of the SCB that makes it so useful. For example, a number of SCB devices can be placed around the circumference of a missile for hypervelocity missile control. When a change of direction is required, a coded signal is applied to fire one or more SCB-driven devices to produce the needed thrust. The coded signal can be transmitted via wire or optical fiber. (A similar device using optical fibers for both the power and code leads has also been proposed by Glenn Kuswa, 4030, and Dave Benson, 1512.)

'Slow' Burn, Not a Big Bang

A key feature of an SCB is that it can ignite a variety of explosives by producing a subsonic burn — deflagration, a slow burn relative to the speed of sound in an explosive medium. It does not directly produce a supersonic burn — a detonation — in an explosive. Consequently, the SCB is useful for actuators where gas pressure has to be released (air bags) or where propellant is ignited (rockets) — Olden Burchett (DMTS, 2515) is making a prototype design of an SCB actuator for weapons.

In some cases — for weapons, construction, or mining applications — a supersonic burn is required. A DDT (deflagration-to-detonation transition) device can provide a boost in output that's sufficient to detonate a high explosive. The basic addition here is another tiny column of powder: Lighting it slows the response time somewhat (to 50 microseconds), but that's still a respectable speed — 100 times faster than the hot wire. (Bob Bickes, Anita Renlund, 2515, and Phil Stanton, 2514, have demonstrated several prototype devices.)

Dozen Wafers at a Time

Using an automated process, the Center for High-Technology Materials at UNM (earlier under the direction of Roy Colclaser; later Kenneth Jungling) has fabricated thousands of SCBs for Sandia. By combining two-mask lithography (that produces a type of computer-generated photograph) and a photoresist technique, about a dozen wafers can be produced in one shot. Each wafer contains hundreds of chips, and every single chip has an SCB on it.

On the other hand, making bridgewires is still labor-intensive: Each wire is individually snipped, manually formed into the right shape, and then hand-welded. "One of our contractors has only a few workers experienced enough to do this," says Bob.

In contrast, the high-throughput method for the SCB involves microelectronic dicing and ultrasonic welding. "The closer it approximates standard semiconductor technology, the cheaper it promises to be," says Bob.

Finally, Dale Blankenship (7471) has investigated methods by which the SCB chip can be attached — for test assembly purposes — to a ceramic header by simply dropping the chip into a pre-made slot.

"We've demonstrated how easy fabrication



HE HAD THE IDEA for an SCB five years ago, and Al Schwarz (now ret.) — here in the center, talking with Jere Harlan (right; 2512) and Terry Ferguson of Mound — was glad to be back at Sandia for the tech transfer conference on SCBs. "Bob [Bickes] has done a great job of developing the idea and getting management support in the form of funding and manpower," says Al. His plans? "Well, now it's up to private industry — here in New Mexico, I hope, where new jobs could be created," he says.

could be," says David Anderson. "Even better, we've shown that the SCB's potential for reliability and consistency of performance is greater than that for standard hot wires."

"All this is completely new technology that's not being done by private industry," Paul Wilcox concludes. "We think it's a good candidate for commercialization."

There's evidence that the division's — and department's — optimism may be justified. Eighty people from 43 organizations outside Sandia (and 40 Sandians) came to the division-organized, day-long tech transfer conference on Feb. 17. Although initial production of SCBs would require a major commitment, private industry may yet make a beaten path down Wyoming. ●ID

Bridgeworks

How the Igniter Operates

The SCB is made from a semiconductor, a material whose electrical conductivity is between that of a conductor and an insulator. Specifically, it's a very heavily doped silicon or polysilicon film overlaid on a sapphire or silicon chip that's about 1.5 millimetres square — about half the size of the head on an eyeglass-hinge screw — by a few tenths of a millimetre thick.

(The very heavy doping — addition of impurities such as phosphorus to the silicon — is what makes the SCB different from the semiconductors an average person encounters in a word processor, coffee maker, or car.)

The bridge looks like the crossbar on a microscopic letter 'H,' and is typically 380 micrometres long by 100 micrometres wide by two micrometres thick. The doped bridge *per se* conducts the current flow from the overlaid aluminum lands (the trunks of the 'H'; one micrometre thick) that electrically connect the SCB to metal posts and the outside world. (The lands, in turn, can be shaped to tailor the device to particular applications; much of the data demonstrating this tailoring was contributed by Dave Benson, 1512.)

Plasma Ignites Powder

When current is applied to a hot wire, the wire merely gets "warm" (to about 900 Kelvin — approximately its melting temperature).

In contrast, when current is applied to the SCB, the bridge vaporizes and forms a hot plasma (about 5500 Kelvin) — similar to a gas but a better electrical conductor. The plasma expands and penetrates the granules of powder pressed against it; then the plasma condenses and transfers its heat energy to the powder.

Many Sandians investigated the physical processes involved in the SCB. (Marv Larsen, 5214, investigated the properties of the so-called microconvective heat transfer. Plasma spectroscopy was carried out by Wayne Trott, 1128, and Anita Renlund, 2515; light emission was measured by Phil Hargis Jr., 1124. Elucidation of the plasma physics, using fast-framing photography, was done by Dave Benson; streak records of the plasma formation were obtained by Lee Heames and Gail Weaver, both 7556.) This work permits SCBs to be designed for a wide variety of special applications.

The SCB requires only three millijoules of energy, one-tenth that required by a typical hot wire, and can be driven with a 20-microsecond pulse, one-hundredth as long as that needed for a hot wire. (These two features are particularly important for space and mining operations, where low-energy input and microsecond timing are vital.)

Despite the long list of advantages, "don't necessarily expect SCBs to replace all hot wires," warns Bob Bickes Jr. (2515), "because hot wires work very well for many uses.

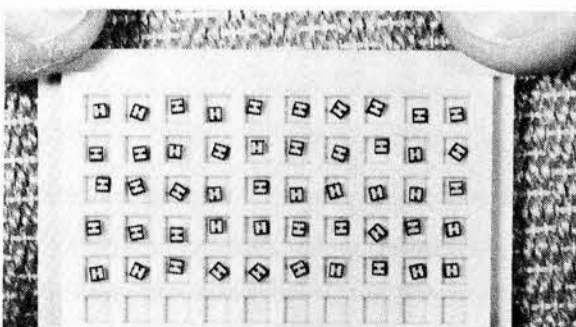
"However, in some applications," continues Bob, "small-diameter hot wires can be a problem: They are made of metal and can fail by acting as a fuse when current goes through them. That is, they melt and open up, and may not set off the powder."

On the other hand, "the SCB has a fail-safe mechanism built in," he says. "When heated, its resistance doesn't go up like an ordinary metal's; in fact, the resistance goes down. The SCB is driven so strongly towards making plasma that it can't 'open up and fail' when the current required for firing the device is applied. Also, the required current pulse for setting off the SCB is different enough from those occurring randomly that it makes accidental triggering of the SCB improbable."

Passed Safety Tests

The SCB test assembly has passed important safety tests (explosive testing was carried out by Explosive Projects and Diagnostics Division 2514). It easily exceeded the criterion for the no-fire test (a requirement for many military applications): The SCB can tolerate more than one amp for five minutes without setting off the explosive. And results from the electrostatic-discharge test (one that simulates the static discharge of a human body or a near-lightning charge) show that the SCB is at least as safe as conventional igniters, for which U.S. industry uses metal bridgewires and foils.

In general, the results demonstrate that the SCB has enough resistance to heat the explosive to ignition. Yet, it has a resistance that's also low enough (about one ohm) so that it can't easily be set off by accident.



AS RECEIVED FROM UNM's Center for High-Technology Materials, a tray of semiconductor bridge (SCB) chips. Each square chip is narrower than the head of an eyeglass-hinge screw. Each 'H' is an SCB.

Welcome Revs Up for the New Folks on the Block

The R.S.V.P. invites went out last month. Almost 150 of them, all to new staff members at Sandia. With a week-long session of activities chalked out for March 9-13, Phase I of the official welcome called Professional Staff Orientation (PSO) is firmly in place on Sandia's doorstep.

It's not a test drive — not now. The organizers got the welcome wagon charged up last November, when they ran the first session for 100 new folks at the Labs. And the third session is already scheduled for August.

The chassis of the PSO-I program basically stays the same: an executive overview of Sandia by Irwin Welber; several outlines of Labs functions by Directors — accompanied by visual aids and followed by Q/A sessions; tours of labs and test sites; presentation of a set of seven videos on Labs services; and small-group discussions.



TUNING UP the next Professional Staff Orientation - Phase I (PSO-I) session are PSOP Committee Chairman Harry Saxton (2500), Berweida Learson (left), and Phyllis Padilla (both 3521).

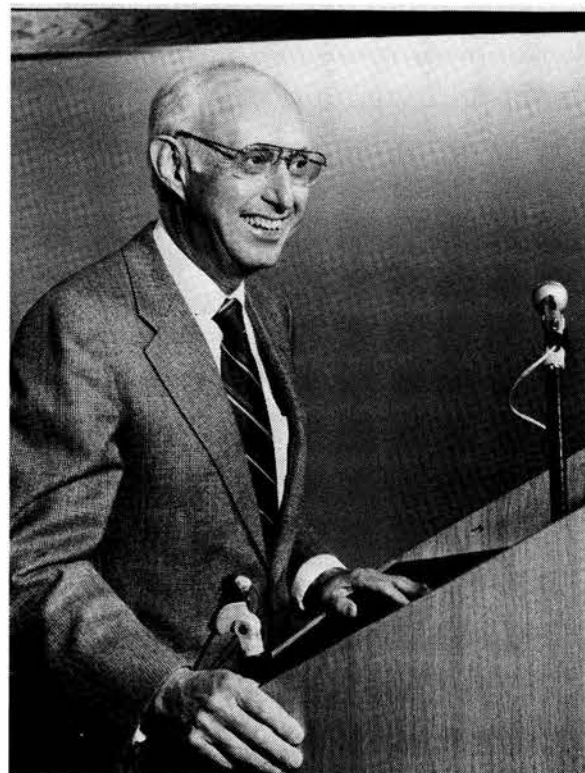
The perspective given in the comprehensive overview was carefully planned: "The program starts out with a global view of the Labs," says Harry Saxton (2500), PSO Program Committee chairman, "narrows its focus to look at some technical areas, then ends with a spotlight on the employee as a professional."

Transmission of Ethos

"PSO-I's a complete package of information, meant to communicate Sandia's ethos to new people," explains Berweida Learson (3521), program designer. "Also to make them aware of the support services — both technical and administrative — that exist."

It's not that incoming Sandians weren't formally

(Continued on Next Page)



PRESIDENT WELBER'S EXECUTIVE OVERVIEW sets the tone for new-hire orientation at the Tech Transfer Center. "Sandia only takes on work that can be sustained and has staying power," he said last November in explaining changes in the Labs' future. The next two PSO-I sessions are already lined up for March and August.

Higher Education for New Hires

Orientation Process Stretches Both Ways

The most recently launched part of orientation, PSO-Phase I (see "Welcome Revs Up"), is designed for staff employees who've been at Sandia no more than six months. But that's only the middle of the story.

The whole orientation process for new hires is now stretching to span a two-year period. And although a lot of the packages are new, not every wheel for the welcome wagon had to be reinvented.

- "Our acceptance package — for people who've received job offers but haven't said 'yes' yet — is being reworked," says Ralph Bonner, Director of Personnel 3500 and a PSOP Committee member. "After the committee looked at PSO and several other models, we re-examined the front-end orientation process for all of our new hires — to see if we could improve it and have it dovetail with PSO." The result is a personalized, comprehensive feature called New-Employee Orientation (NEO).

- The first "hello" to all new hires during their first week at Sandia will be a NEO seminar, according to Ralph. At a relaxed pace over two half-days, it'll cover practical issues such as security, time cards, vacation schedules, the credit union, and parking. The main "housekeeping" points will be summarized and handed out in book form. The personalized approach will include a general welcome by each division supervisor. Also planned is an updated packet of information on the Labs (and also on Albuquerque) called "Welcome to Sandia."

- The first "official" step in PSO is timed for the first month of employment. A Labs resource directory, dubbed "At Your Service," will be handed out to each new employee. It'll contain a cross-referenced list of service areas, contact people, and phone numbers.

- Next is "Assimilation" — (to be piloted soon) for brand-new professional employees (who've been here no more than two months). It's a half-day introductory session, between the staff member and the division supervisor, on job-related skills and values. The "ice breaker" will

be an inventory that's filled out by both and then discussed. It's meant to standardize and increase interaction — away from a stereotypical "Here's your desk, here's your phone" approach. Even more, "it's an incentive for both to concentrate on specific skill requirements right from the start — and thus enhance the new hire's effectiveness on the job," says Berweida Learson (3521).

- PSO-I fits in about here at 1-6 months of service.

- Then PSO-II, at 6-12 months, is a meeting with the VP. "It can be a breakfast, lunch, dinner, or tea — whatever's convenient and comfortable for the VP," says Berweida. "It's a chance for new employees and their VPs to discuss Sandia issues and initiatives from the perspective of their organization."

- Then comes PSO-III, at 12-24 months. "Here we delve into specific, in-depth modules — seminars, really," says Berweida. "We'll take the major technical overviews given in PSO-I — energy, nuclear weapons, non-nuclear weapons, computing, and tech base — and expand on them. That way, employees will have some perspective on what it takes to be successful in their given areas." MTSS and TSAs will be expected to enroll in one or more modules (ranging in length from two to 40 hours). For example, the tech base module will cover patents, publishing, and collaboration among researchers as tools for success. Another course will be geared to MLSs.

- At about this time, new employees in components design will take part in the Production Agency Exchange Program. They'll spend a week at one of the four integrated-contractor facilities: Mound, Bendix, Rocky Flats, or GEND. This program will acquaint the participants with some of the people and operations involved in weapons development.

Fitting into the Big Picture

"PSO benefits Sandia and its employees most by getting newcomers to understand who and

what's around them," explains Dick Fairbanks, supervisor of Education and Training Division 3521 and a PSOP Committee member. "And in that way we're meeting the major objective of the PSOP Committee: to help people become productive sooner. We do that by shortening their learning curves."

- Finally, there's MPG — a.k.a. Managing Professional Growth — primarily for those on-roll for about two years. That's a workshop lasting one-and-a-half days, in which the tool is a "Skills Inventory" for employee and supervisor that compares their perceptions of the employee's job-related values and strengths and weaknesses.

MPG, in turn, is meant to help the employee overcome weak points and make intelligent career decisions. In effect, MPG can help supervisors by providing the employee with a preview of the annual performance review.

"With MPG, we're branching out into discussing career growth — and job satisfaction and enrichment," says Berweida. "Employees need to take some time and define exactly what success means to each of them."

MPG didn't have to be started from scratch: It's been around for five years. Wilma Salisbury (3523) is one of four instructors who run the workshop. They offer it three to four times a month (except for a break from April to June), and occasionally advertise it in the Weekly Bulletin.

"MPG isn't limited to new hires," says Wilma. "Anyone can sign up for it as a refresher course. In fact, we'd recommend it to anyone who's changed jobs and/or supervisors."

"Although employee development is partly the supervisors' responsibility, the whole point of Sandia's orientation process is to make their jobs easier," says Berweida. "We'll be preparing supervisors even more by sending them a packet sometime this year. It'll include checklists of points to cover with new hires, as sort of a memory jog."

In the end, the division supervisors are the focal point for employee development — from NEO to MPG and beyond.

A Task of Reaching Out

Education Committees Make Strides

The PSOP Committee is structurally tied to SEC and OPEC. For you most-recent hires, that's not the Securities and Exchange Commission and the Organization of Petroleum-Exporting Countries, but the Sandia Education Committee, chaired by VP Everet Beckner (5000), and its subsidiary On-Premises Education Committee, chaired by Harry Saxton (2500).

PSOP's the *ad hoc* subcommittee that's directly involved in the design of employee orientation. Formed in the summer of 1985, PSOP's also chaired by Harry. Other members are Glen Kepler (1810), Bill Alzheimer (2800), Herb Pitts (3100), Ralph Bonner (3500), Danny Brown (3520), Dick Fairbanks (3521), Bruce VanDomelen (3538), Glenn Kuswa (4030), Bill Marshall (6250), and Jim Wright (8150).

Looking Back

Once upon a time, Sandia had an orientation program for new MTSs who had received their clearances. Many Sandians remember it as "Tech Orientation," or by its nickname: "Parade of VPs." It consisted of 20 hours of classified technical presentations given by Sandia's Vice-Presidents — and limited to an audience of technical staff members.

It was only two years ago that the second and last of those sessions was held. "Then the PSOP Committee was formed," says Harry. "We tossed around some ideas as to how we might best equip all new professionals with the information and tools that would ease their transition into Sandia."

With the help of Berweida Learson and Phyllis Padilla (both of Education and Training Division I, 3521), the PSOP committee designed, built, and tested the new program. It took need assessments, multiple design iterations, and consolidation of a variety of parts to create a cohesive whole. Now PSO-I's ready to be offered to new professionals twice a year, in March and August. By March, the PSOP Committee will be dissolved — with its task accomplished.



HISTORY OF SANDIA is the forte of Dick Lynch, Director of Nuclear Waste Management and Transport 6300. One of the speakers at PSO-I, he summarized Sandia's contributions to the nation's nuclear deterrent. A handbook called "Historical Update" was also provided to participants by Necah Furman (3151A).



(Continued from Preceding Page)

PSO-I

welcomed in the past. Far from it. Bits and pieces of orientation were always part of that first Monday, along with the obligatory signing of numerous forms (see "Orientation Process Stretches" story). And informal orientation was — and is — part of supervisory duties, as time and space allow.

However, in the past, "new hires came to feel at home — in what is a unique and complicated work environment — largely by osmosis," says Dick Fairbanks, supervisor of Education and Training Division I (3521). In other words, newcomers had to rub shoulders with old-timers over a long period of time and learned on their own.

Today, the effort is to make orientation even better. "What we have now in PSO-I is material presented in a logical, meaningful way so that new people become more aware of their environment, far beyond the specific jobs they were hired into," says Dick.

"New employees aren't just part of a singular division — or department or vice-presidency," says Harry. "As Sandia employees, they become part of a culture. The entire PSO effort is aimed at helping them understand that culture and to begin working effectively in the Sandia environment."

The main features of the company ethos? Excellence, results, cooperation, interdependence, contribution, and teamwork are all on the organizers' lists.

And, the Labs ethos isn't just limited to the Albuquerque site. Six new people from Sandia Livermore participated in the pilot session, and several more are expected in March. "It's important that all our employees understand that we are one company, with a common purpose and common missions, and that we interact more frequently than incoming people may realize," Harry explains.

Rousing Welcome

The invite distributions — about 60-105 MTSs, 25-45 MLSs, and about three TSAs — follow typical hiring patterns in job classifications, according to Phyllis Padilla (3521), program administrator. All organizations are represented, although some have fewer participants than others, again following hiring practice.

People who've been here from one week up to 24 months were included in the PSO-I pilot. The PSO organizers wanted feedback from a broad range of new hires.

Positive Echoes

The organizers asked for detailed evaluations — and got them. "We needed to know more about what actually worked, what didn't, and how we could make things better," says Berweida. "And people were eager to tell us."

Some said the program should be offered to new hires ASAP: within the first six months of walking through the door. According to Phyllis, the cutoff point is decreasing steadily: With PSO-I scheduled twice a year from now on, most new employees will participate within the first six months of their careers.

"Many participants were impressed that upper management would expend the time and energy to

MEETING AGAIN after last November's new-hire orientation is part of a discussion group headed by Melodie Owen (bottom center, 1000A); Ray Finley (bottom left, 6313) and Bob Habbit (9213); (from top left) Emily Giese (151), John Clever (2612), and Irene Dubicka (3162). The group met for lunch at the Coronado Club last week to compare notes on the job-related after-effect of PSO-I.

support the program," says Berweida.

A few felt that five days of orientation is too long a stretch away from their research, phones, and mailboxes. And so one of the upcoming refinements will be a more condensed program (the same topics covered in 30 hours instead of 38) and a more relaxed schedule (mini-breaks, full-day sessions that end early at 3:30, and two sessions shortened to half-days).

And the topics of the talks? In November, they included Sandia's history, the budget, nuclear weapons, non-nuclear weapons, computers, energy, the tech base, and personnel issues. "The balance of technical to non-technical subject matter seemed about right," says Phyllis. "And most participants expressed appreciation for the discussions and presentations." The plan is to keep the content and structure of the program the same.

And what about feedback from the most involved Director? "PSO-I is a great vehicle for management," concludes Harry Saxton (2500), "to preach what we already practice." ●ID

In Their Words

Here are some of the comments from participants in the November pilot session of PSO-I:

- As an MLS, I appreciated having the technical exposure, since I can use this information to make more out of my job and to understand the overall picture. — MLS (13-18 months)

- It allowed me to see the purpose of divisions other than my own. — MTS (1-6 months)

- Regretfully, some of us who have been with Sandia for nearly a year had to dig out most of this information on our own. — TSA (7-12 months)

- Good, informative, integrating. — MLS (1-6 months)

- As an MTS, I feel I need to know the Labs' history [and get] an overview of its present activities, a projection of where it's going. I don't need to see a lot of technical details like semiconductor performance curves. — MTS (1-6 months)

- This program answered a lot of questions I had already formed about what is happening at Sandia. — MLS (1-6 months)

- Better than the last. I think it improved the program very much to have the speakers cover associated types of work. — MTS (18-24 months)

- I hope it's destined to become an institution. — MLS (7-12 months)

- I sometimes thought that it was too long and exhausting, but I would not change the format. Part of the problem was keeping up with mail, [phone calls,] etc., at work. — MLS (13-18 months)

- It was definitely an education! — TSA (7-12 months)

- I would add more historical examples of technological contributions and impact that Sandia has had in general. Wow 'em more! — MTS (13-18 months)

- I have not found at other companies the care for employees that Sandia has shown. This type of orientation instills a true company commitment and [a] feeling of wanting to help build on this type of "character." — MTS (not given)

Take Note

It's Open House today for Education and Training's new building. Ribbon cutting, tours, and refreshments begin at 1 p.m. in Bldg. 856 (south of Bldg. 892).

The Hal Baxter Memorial Cross-Country Ski Trail and biathlon practice area will be dedicated at 1 p.m. on Feb. 28 at Fenton Lake State Park in the Jemez Mountains. Hal, who worked at the Solar Thermal Test Facility (6222), died in December 1984 in a mountain climbing accident in Mexico. The two-mile trail and two bridges were developed by Volunteers for the Outdoors and State Parks personnel. Volunteers from Sandia included Ben Blackwell and Sam Beard (both 1553), Helmut Wolf (summer professor), and Pete Pankuch (EG&G).

"Tales of old and pirates bold" will fill Simms Fine Arts Center at Albuquerque Academy on March 5-7 when the school's Parents' Association presents Gilbert and Sullivan's "Pirates of Penzance" at 7:30 p.m. each night. Sandians in leading roles include Brian Dodson (1143) as the Pirate King, Eoin Gray (1253) as Samuel, and Nancy VanDevender (wife of Pace, 1200) as Kate. Dick (1800) and Jennie Schwoebel play Major General Stanley and Mabel. Several other Sandians are members of the chorus.

The New Mexico Chapter of the American Vacuum Society 23rd Annual Symposium has put out a call for papers. The symposium will be held May 4-7 at the Sweeney Convention Center in Santa Fe. One-page abstracts (approximately 150 words) with headings that include titles, authors' names, affiliations, and addresses should be submitted by March 6 to the Symposium chairman, M. T. Paffett, MS D429, LANL, PO Box 1663, Los Alamos, NM 87545. Copies of the symposium registration and short-course program brochures are available in the LAB NEWS office, Bldg. 814.

The first of two March meetings of the Albuquerque Section of the American Institute of Aeronautics and Astronautics is scheduled for March 4 at 7 p.m. at the Bella Vista Restaurant. A one-hour presentation, "Aerial Photography as Viewed from Non-Pilot Eyes," by Bill Kelley and Dan Koblosh of Northrop Corp. includes 35mm slides and a movie taken on assignment for the F-5, F-20, and F-18 programs, plus selected scenes from Paramount's "Top Gun," along with behind-the-scenes anecdotes. For more information, contact Greg Homicz on 4-9065, Walt Wolfe on 6-7648, or Terry Jordan on 4-1899.

Parentcraft, a division of Family & Children's Services, (a United Way agency), offers education in the areas of pregnancy, children of all ages, family and marriage, child care, and support groups. Parentcraft's support includes WarmLine (266-0808), a telephone consultation for parents of young children, available Monday through Friday from 9 a.m. to midnight. For more information, contact Parentcraft on 256-1191.

Little people need big people, and — for kids' sake — Big Brothers/Big Sisters needs bowlers. "Super Strikes," Big Brothers/Big Sisters Sixth Annual Bowl-a-thon, will be held March 29 from noon to 5 p.m. at Leisure Bowl. For every \$25 in pledges, participants get one chance in a drawing to be held after the event. Prizes include a trip to Disneyland or Las Vegas, a VCR, a 13-in. color TV, or a one-year membership to Cosmopolitan Lady. For more information or sponsor sheets, call 292-7648.

For the first time, the works of the UNM department of art and art history faculty will be auctioned — in the ballroom of the UNM La Posada dining hall March 7 at 7 p.m. Paintings, sculpture, photographs, jewelry, ceramics, drawings, prints, and limited-edition books by other contributors such as Charles Mattox, Elaine de Kooning, and Beaumont Newhall will be auctioned. Artworks may be pre-

viewed in the ballroom on the day of the auction beginning at 3 p.m. "Modern Art Blooms in the Desert" is the topic of a panel discussion by art professionals and art communicators at 4 p.m. A reception follows.

Sparkling diamonds, rubies, emeralds, and sapphires: Learn about the art of appreciation and investment in these and other precious and semiprecious gems from a registered gemologist in a SERP-sponsored gemology class. Each session will examine the gemological properties, myth, major sources, investment consideration, and jewelry uses of the topic stone. The hour-long class meets on Thursdays at 12500 Montgomery NE beginning March 5. For more information, contact SERP on 4-8486.

The Sanado Woman's Club will meet March 10 at the Pyramid Plaza Holiday Inn at 11:30 a.m. The luncheon meeting includes a fashion show. Call 296-3064 by March 5 to make reservations. Lunch is \$9.75.

Sympathy

To Paul Yourick (3428) on the death of his grandmother in Albuquerque, Feb. 9.

To Ramon Garcia (3424) on the death of his sister in Santo Domingo, Feb. 12.

To Harry Saxton (2500) on the death of his grandmother in Hollywood, Calif., Feb. 16.

RETI R I N G



Billy Hickerson (5122) 40 yrs.



Gerry Becker (2833) 30 yrs.



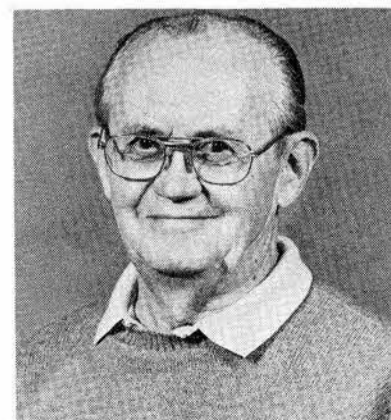
Leo Scully (6311) 26 yrs.



Ruth Lighthill (2321) 25 yrs.



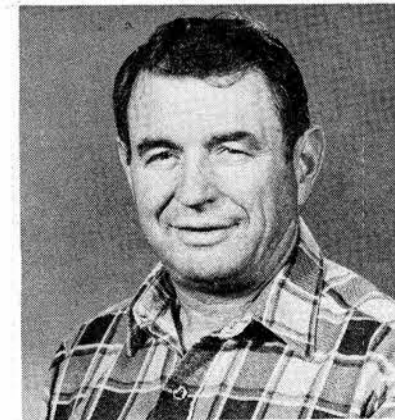
Alan Swain (DMTS, 7223) 25 yrs.



Tom Earp (7137) 38 yrs.



Joe Muench (7222) 40 yrs.



Alan Netz (1833) 30 yrs.

Girl Scout Week, March 8-14, marks the 75th Anniversary of Girl Scouts of the U.S.A. In September 1986, Girl Scouts across New Mexico began celebrating their birthday by giving a Gift of Services to their communities. The Chaparral Girl Scout Council anniversary celebration kicks off with a birthday party March 12 at Tingley Coliseum from 4:30 to 6 p.m. and includes marching bands, a gigantic "living" birthday cake, music, and singing. For more information, contact the Girl Scout Service Center on 243-9581.

The Rocky Mountain Elk Foundation (RMEF) will hold a banquet and auction on March 14 at the Albuquerque Hilton Inn beginning at 5 p.m. RMEF is an international non-profit organization involved in elk-management projects. Proceeds will benefit RMEF programs and NM elk projects. Rifles, bows, wildlife art, bronzes, and other items will be available at auction. Tickets will not be available at the door. Call Phil Sonier on 889-8001 or Robert Brown on 265-5731 for more information.

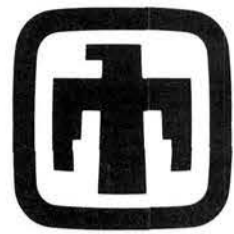
Extra copies of the "State of the Labs" and "Technical Accomplishments" issue are available in the LAB NEWS office, Bldg. 814. If you'd like a copy, either stop in or mail a self-addressed 9" x 12" envelope to Div. 3162.

Retiring this month and not shown in LAB NEWS photos are Christina Baca (2831), Vernal James (6451), and Orville Padilla (6450).

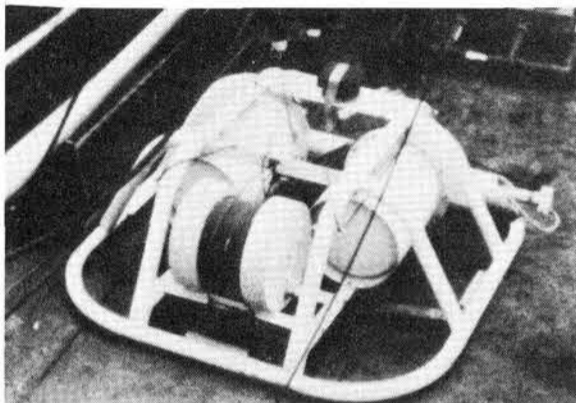
Too Many Photos, Not Enough Space

LAB NEWS received many outstanding photos from the technical line organizations for possible use in our "Technical Accomplishments

1986" section last issue. Space constraints didn't allow us to use some that we would have liked to. They appear on this page.



B-1B BOMBER drops a B83 flight test unit (FTU) at Tonopah Test Range. A multi-year effort to verify the B-1B's compatibility with the B61 and B83 bombs was completed last year.



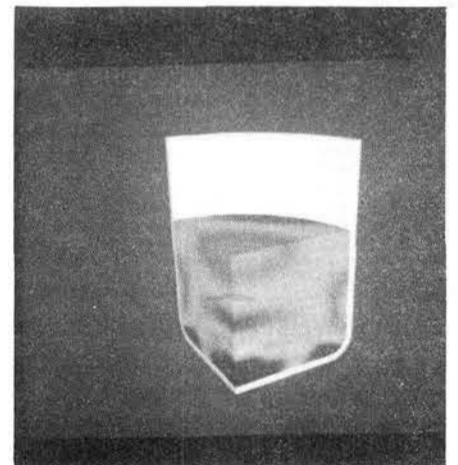
SANDIA'S SEMS (Seafloor Earthquake Measurement System), deployed offshore Long Beach, recorded seismic data from two earthquakes in July.



SANDIA EXPERIMENTERS RECOVER an ice penetrator after a drop north of Prudhoe Bay, Alaska. The penetrator bores through several tens of feet of ice when dropped from a few thousand feet altitude.

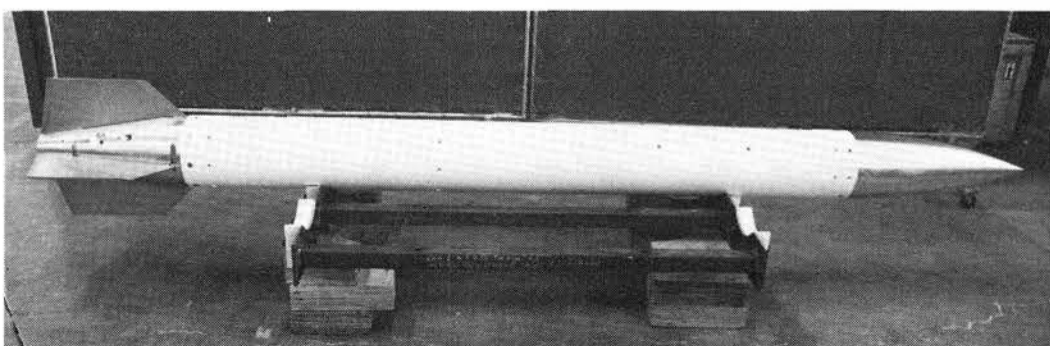


DRAMATIC PHOTO taken by David Abrahams (8186) shows firing of a W82 Joint Full Function artillery shell at Yuma Proving Grounds. Shell reached an angular acceleration of 16,000 rpm.



THREE-DIMENSIONAL FORGING SIMULATION shows concentration of deformation in the interior of a metal workpiece. New modeling capabilities reduce cost and time spent to optimize process parameters at the production agencies.

THIS SEABED PENETRATOR was used in tests to determine how much ocean-floor soil disturbance is created by the impact and burial of penetrators capable of carrying high-level nuclear waste.

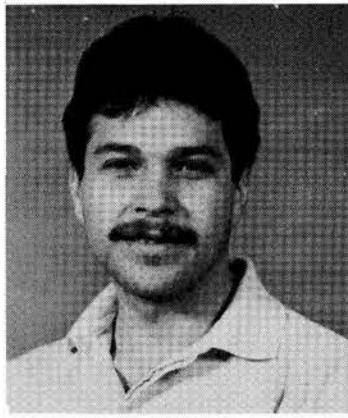


FULL-SCALE MODEL of the AROD (Airborne Remote Operated Device), a small, highly mobile aerial reconnaissance vehicle, is 30 inches in diameter at the top and 5 feet tall.

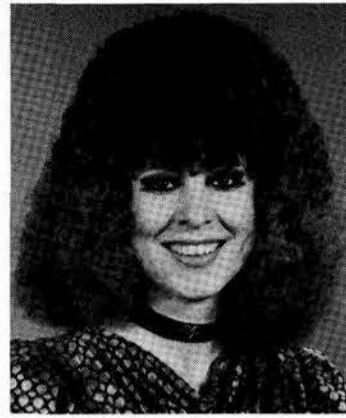
MILEPOSTS

LAB NEWS

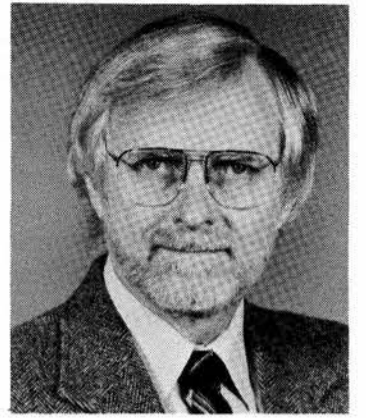
FEBRUARY 1987



Marty Jinzo (6442) 10



Mary Gallegos (3735) 10



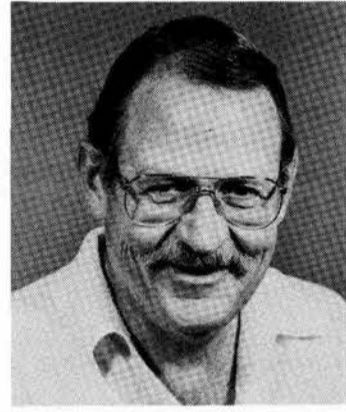
Bob Hughen (9110) 25



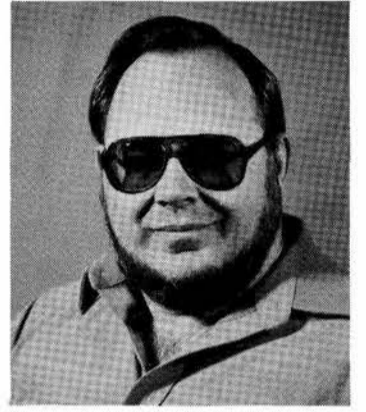
John Loukota (7125) 20



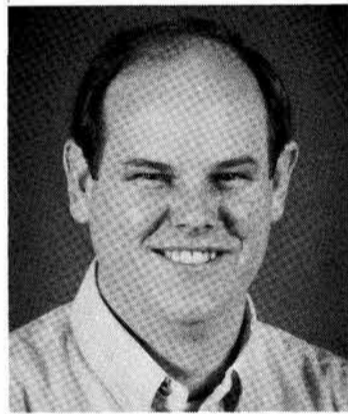
Juanita Mansfield (8233) 20



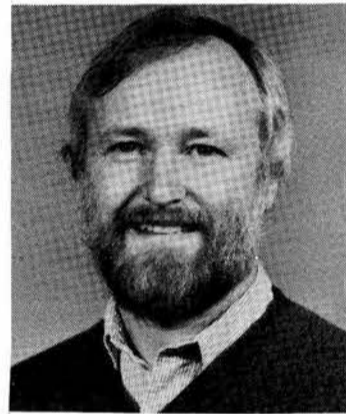
Bob Manhart (3151) 20



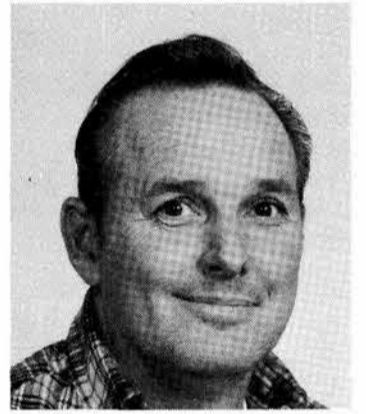
Bob Varga (7542) 20



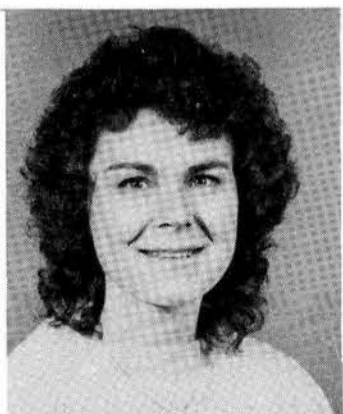
Dan Hardin (8462) 10



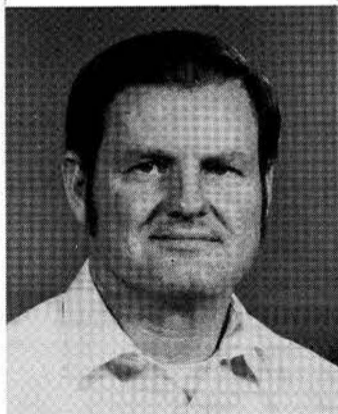
David Kestly (2346) 20



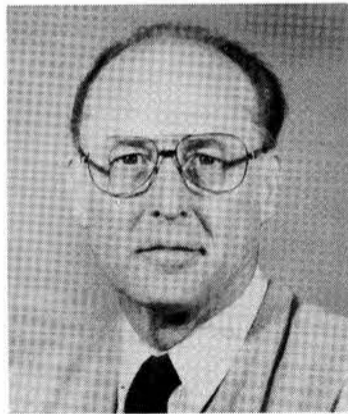
Gary Fisher (8413) 20



Kathy Sedlacek (3411) 10



Ben Duggins (7533) 20



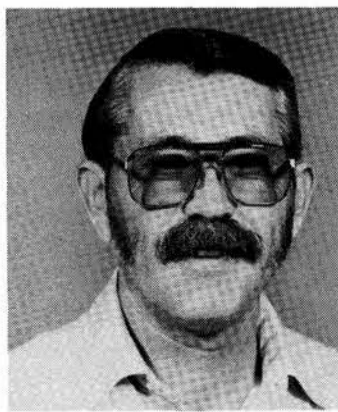
Wayne Lathrop (7526) 25



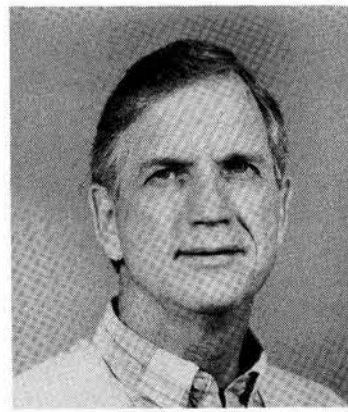
Dal Jensen (2565) 25



Bob Anderson (2857) 30



Frank Garcia, Jr. (7243) 25



Don Pitts (3433) 35

Fun & Games

Bowling — Gary (315) and Ruby (6400) Cochrell won the SANDOE Best Ball Tournament on Feb. 7-8 at the Holiday Bowl. Tied for second place were Mike and Roni Montoya, and Thelma Cashman and Wayne Yoshimoto (7474). The next tournament is a 4-Game No Tap at Fiesta Lanes on March 14-15.

* * *

Golf — Sandia Men's Golf Association's spring membership meeting is scheduled for March 3 at the Coronado Club from 4:45 to 7 p.m. All current and prospective members are invited to attend. Spring is just around the corner, and the first tournament, the Equinox, is scheduled for March 21. This year, five 18-hole current-year scores are required before participating in any tournaments after May 1.

* * *

Soccer — The Sandia Strikers men's indoor soccer team won the Men's Division III Championship

on Jan. 31, defeating the Explosion team, 7-3, at the Albuquerque Indoor Soccer Arena. Gilbert Quintana (5245) is the team manager. Team members are: Gilbert Benavides (2543), Paul Berlowitz (1134), Tod Criel (1551), Norman Day (9213), Ray Decker (7242), John Dink (5245), Ed Holling (2853), George Kenefic (7864), Kevin Marbach (9212), Jim Purvis (1632), Ken Osburn (2826), and Michael Decker.

* * *

Softball — A pre-season softball meeting for interested players and coaches is set for March 5 at the Coronado Club from 4:45 to 6:45 p.m. Instruction packets containing information about the league rules, how to join, and names of association executive board members will be distributed. Rosters for the season (expected to start April 20 or 27) are due March 20.

Legal Break-In on Campus



On Ditch Day, the date of which is kept secret until that morning, all [Caltech] seniors must leave campus or risk being chained to a tree. But they leave behind, on their dormroom doors, "locks" that they hope will be impenetrable. It is the underclassmen's duty to try to pick them. When they get into the seniors' rooms, the underclassmen, known as "wimps," perform bizarre pranks. A few years back, wimps broke into a senior's room and were dissatisfied with the food and liquor that he had left for them. So they disassembled his Porsche, which he had unwisely left in the parking lot. When he returned that evening, he found his car reassembled in his room, with the motor running.

Wall Street Journal

User-Friendly, Abuser-Surly



In the Hyperbike, bicycle steering-geometry is chosen to trade off stability against maneuverability. It will be highly unstable; its ceaseless tendency to throw itself over will be countered by fast-acting computer-control of the steering. The rider knows nothing of all this. His movements of the uncoupled handlebars merely indicate to the computer the direction in which he wishes to travel. . . . By simply locking off the stabilizing computer (or even reading in a deliberately malicious program), the Hyperbike could be made secure against theft. The idea is that any thief trying to pedal it away would be thrown violently on his face within seconds.

New Scientist

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

- Limit 20 words, including last name and home phone.
- Include organization and full name with each ad submission.
- Submit each ad in writing. No phone-ins.
- Use 8 1/2 by 11-inch paper.
- Use separate sheet for each ad category.
- Type or print ads legibly; use only accepted abbreviations.
- One ad per category per issue.
- No more than two insertions of same ad.
- No "For Rent" ads except for employees on temporary assignment.
- No commercial ads.
- For active and retired Sandians and DOE employees.
- Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

- USED OAK FLOORING, 2-1/4" wide, approximately 200 sq. ft., best offer on all or part. Smith, 296-1908.
- WEIGHT BENCH w/leg lift, \$20; Akai reel-to-reel tape deck, auto-reverse, tapes, \$200. Kovacic, 256-9867.
- ORGANS: Lowrey Orchestra Holiday, magic Genie, 2 keyboards, bench, cushion; Hammond spinet, 2 keyboards, built-in rhythm accompaniment. Michaud, 292-3704.
- AKAI AA-6300 STEREO RECEIVER, 20W RMS per channel, wood cabinet, \$50. Benecke, 255-1356.
- NORDICA SKI BOOTS, men's size 10, rear entry, \$30; tire chains, CR78-14 or similar size, \$15. Hickox, 299-0772.
- TOSHIBA FULL-SIZE MICROWAVE, Hoover Spirit vacuum cleaner, Bissell electric broom, 1920s single bed and dresser (needs work). Acton, 298-7748.
- MINIBLINDS, 4 sizes and colors; storm door; one vertical blind. Baca, 298-7748.
- MICROWAVE, Litton Memorymatic, w/accessories, \$300; Remington 721, 5x57 custom barrel, w/Leopold 6X scope, \$400. Scranton, 869-6589.
- MOTORCYCLE HAULER, Trail-A-Bike, mounts on hitch tongue, holds front wheel, rear rolls, for bikes less than 300 lbs., \$25. Schkade, 292-5126.
- KITCHEN TABLE, formica, oval, 4 chairs, leaf, off-white, \$75; 2 bookcases: 2.5' x 5', walnut pressed wood, \$25. Davis, 293-7457.
- COFFEE TABLE w/matching 6-sided end table, glass and cane top w/brass border, cost \$400, sell for \$139. Barr, 821-5870.
- COCKATIELS, breeding pair, normal gray, produce gray and pearly, acclimated to outdoor aviary, \$90. Stevens, 883-0480.

- OWNER'S WORKSHOP MANUAL for Chev. Luv pickup, 1972 through 1981, series 1 through 11, 1.8 liter. Widenhoefer, 298-2510.
- POLAROID ULTRASONIC RANGE-FINDER designer kits, new in box, cost \$165/ea., asking \$275/both. Sims, 821-7336.
- TWO LOVE SEATS, plaid on beige background, \$85/ea.; 2 windsurfer boards, magnum, beginner/intermediate, \$550/both. Eentz, 299-3448.
- METAL FARM GATE, 16', \$20. Cibicki, 877-7098.
- STORM DOOR, 36"; kitchen sink, cast iron; bathroom heater, best offer. Gendreau, 268-3436.
- DOUBLE BED, Sealy Prestige Posturpedic, box spring, frame, complete, \$225. Moss, 298-2643.
- TALKING ELECTRONIC SCALES, \$50; 12-in. NEC amber monitor and IBM-compatible CGA card, \$125. Shurtleff, 884-4909.
- DINING TABLE 42" round, walnut finish, two 8-in. oak leaves, 1920 vintage, \$150. Dalphin, 265-4029.
- BOXING COLLECTIBLES: ring magazines, 1949-85; "Boxing Illustrated," 1958-70; "World International," 1965-85; others. Hole, 266-3573 after 5.

- KENMORE WASHER, \$35, needs work; gold velour couch, \$50; garbage disposal, \$40. Torres, 299-5789.
- INSULATED CAMPER SHELL, fits long wide pickup bed, \$200. Eversgerd, 897-0544.
- SEWING MACHINE CABINET, w/matching chair, \$60. McInteer, 296-1656.
- BETA VCR, Sanyo 6800, 4-head, IR remote, needs repair, 10 L-750 tapes, \$100 complete. Trudell, 898-8049.
- CHEV. 350 ENGINE. Chavez, 867-2213.
- FIRESIDE BENCH, antique, \$50; push-type lawn mower, \$25; nylon net for fruit tree, 22' x 26'; traverse rod, 110". Krahlung, 268-8126.
- FARM-ALL TRACTOR, Homelite 16" chain saw, Montgomery Ward rotary cultivator. Lopez, 865-6310.
- BUNK BEDS and matching 4-drawer chest, Sears, \$300. Bartberger, 823-2843.
- CHEV. WHEEL, 5-hole, standard 15", w/F78-15 WSW tubeless 4-ply polyester tire, mounted, \$10. O'Bryant, 268-9049.
- AKC GOLDEN RETRIEVER PUPPIES, w/papers, \$200. Schuch, 281-1790 evenings.
- LITTON 4-BURNER MICROMATIC RANGE, w/microwave in oven, \$150; separate range hood. Fianning, 298-0743.
- DISHWASHER, Hotpoint Mobile Maid energy-saver, 2 yrs. old, w/unused butcher-block top, almond, \$200 OBO. Sheldon, 293-0467.
- POOL TABLE, Brunswick "Bristol," full-size, 8' x 4'; HO-scale train table layout, all accessories; G-78x15 Ford wheels w/snow tires. Dresser, 821-7292.
- WALKER/JOGGER EXERCISE TREADMILL, Sears, \$150; 1-1/2-hp outboard gasoline engine, \$125. Johnson, 296-1917.
- DINING TABLE mahogany, oval, w/2 leaves, Early American, 6 chairs, \$200. Garcia, 298-2898 after 5.

- WASHER AND DRYER, Sears Kenmore, white, \$300/pair. Beck, 294-6868.
- WICKER BEDROOM FURNITURE: 2-drawer dresser, bookcase, footstool, \$75. Hendrick, 296-2163.
- TORO COMMERCIAL WEED EATER, Toro commercial 19" lawn mower, \$120/both. Marchi, 291-9681.
- WOOD CRIB & MATTRESS, \$90; Head skis, 170cm, bindings, \$45; size 7 boots, \$25; steel file, 2-drawer, \$25. Crow, 821-0956.
- ITALIAN FLOOR TILE, green, white, & brown pattern, half-price; rust-colored sleeper/sofa, \$75. Marder, 883-3863.
- BALDWIN ACROSONIC PIANO, light finish, \$700; 23' Silver Streak travel trailer, self-contained, \$3300. Harvey, 298-8278.
- GIVE-AWAY: drapery rods, various lengths; refrigerator, needs charge; car ramps. Pierce, 299-2801.

Retiree Wanted

Service America needs Q-cleared retiree to stock Sandia vending machines. Must have retired within last six months. If qualified and interested, call June Aydelotte (3543) on 844-7433.

- TWO SNOW TIRES: A78-13, mounted, \$25; Kenmore dishwasher, \$25; queen-size Ratan sleeper/sofa, blue/brown print, \$250; white commode, \$10. Trellew, 292-7369.
- CHINA, 77 pieces, Style House Duchess pattern (gray pinecone w/silver), 3 storage cases, \$75. Stein, 299-8875.

TRANSPORTATION

- '85 HONDA Goldwing, Aspencade GL 1200, loaded, stereo, CB Intercom, \$5700. Collins, 266-5868.
- '84 YAMAHA FJ1100, 4K miles, Vance & Hines, Dynojet; '76 Moto Guzzi Lemans, 12K miles, Pirelli's fork-brace, custom. Baca, 298-7748.
- '76 KAWASAKI MOTORCYCLE, high-performance, cafe racer, best offer. Tolman, 266-6995.
- '80 KAWASAKI KZ440, windshield, luggage rack, 12K miles, \$675 OBO. Heifetz, 275-2648.
- '78 CHEV. 1/2-TON PICKUP, AT, AC, PS, PB, 82K miles, \$2250. Heckman, 884-4542.
- SNOWMOBILE, Kawasaki 440 Intruder, tilt trailer, \$1400. Scranton, 869-6589.
- BICYCLE, Raleigh 10 spd., \$135. Shurtleff, 884-4909.
- '84 HONDA PRELUDE, silver, 5-sp., AC, AM/FM cassette, power sunroof, one owner. Woodall, 822-0060.
- '74 FORD COURIER PICKUP, new tires, mag wheels, carb needs work. \$800 OBO. Valdez, 836-2953.
- '83 TOYOTA COROLLA, 4-dr., AT, AC, PS, 58K miles, book value \$5225, asking \$4725. Malm, 293-2127.
- '84 NISSAN 300ZX TURBO, garaged, w/car cover, 21K miles, \$10,500. Bainbridge, 294-4134.
- '65 AUSTIN-HEALEY 3000 MK III, classic, \$7250. Salmen, 266-0402.

- '77 VW DASHER STATION WAGON, gas engine, 4-sp., 55K miles. DeWerff, 298-1029 after 6.
- '71 PORSCHE 914, new paint and upholstery. Bentz, 299-3448.
- MOTORCYCLE, Honda CB-750F Super-sport, ridden only by adult, extras, \$800. Walston, 296-0372.
- '84 CORVETTE, red w/gray leather, glass top, loaded, 28K miles, warranty, \$17,575 book, asking \$15,700. Schmale, 883-4841.
- '54 FORD CUSTOMLINER SEDAN, new paint, interior, and tires, \$1800 OBO; MGA parts, block, tranny, and misc. Schaub, 821-7242.
- '77 HONDA CIVIC, 2-dr. hatchback, new Clarion stereo w/Kenwood speakers. Wright, 296-3850.
- '72 VW BUG, new paint and seat covers, extras, \$1750; women's 10-sp. bicycle, Takara, 26", \$60. Gendreau, 268-3436.
- '77 OLDS. STARFIRE GT, PS, PB, AT, AC, tilt wheel, rebuilt 231 V-6, new paint, louvers, \$1200. McNeeley, 296-1301.
- '84 NISSAN MAXIMA WAGON, fully loaded, cassette, cruise, overdrive, sunroof, complete maintenance record, \$7995. Burton, 869-2541.
- '80 TOYOTA COROLLA, 4-dr., 4-sp., AC, AM/FM cassette, retail book price \$2600. Neel, 821-4270.
- '86-1/2 NISSAN KING CAB 4x4 HARD-BODY, V-6, 8K miles, 60K-mile power train warranty. Torres, 242-9757.
- '73 PLYMOUTH FURY III, 4-dr., 440 engine, trailer-towing package, \$800; women's 26" 3-sp. bicycle, \$50. Houston, 299-4118.
- '75 PINTO STATION WAGON, 4-sp., \$550 OBO. Johnson, 296-1917.
- '75 FORD F-250 PICKUP, supercab w/jump seats, 78K miles, one owner, \$4000. Arris, 266-3414.
- BICYCLE, w/carrier and locking chain. Karnowsky, 255-4045.
- '69 CADILLAC COUPE DeVILLE, loaded, 77.6K miles, light green, vinyl top, \$2300. Orreu, 299-2300.
- '81 FORD ESCORT, white w/blue interior, 4-sp., 63K miles, AM/FM tape, one owner, maintenance records, new battery and timing belt, \$2500. Beavis, 268-3802.
- '78 DATSUN B-210, 4-cyl., AM/FM cassette stereo, 51K miles. Silva, 298-8189.
- '86 NISSAN PULSAR, front-wheel drive, sunroof, stereo, AC, PS, PB, 33 mpg, best offer. Pryor, 294-6980.
- '71 DATSUN 1200, parts only, \$150 OBO. Treadwell, 344-1426.
- '73 CHEV. LUV PICKUP, \$1500. Montano, 881-2907.
- '79 DATSUN 510, 2-dr., hatchback, AC, 5-sp., \$1400. Tobyas, 877-0354 after 5 or weekends.
- '78 DATSUN KING CAB TRUCK, 5-sp., \$1250; five 10x15 6-hole rims w/Armstrong "Rhinos," \$275. Loucks, 281-9608.
- '75 AUDI FOX, 4-dr., 4-sp., fuel-injection, 95K miles, \$800. Crow, 821-0956.
- '85 BRONCO II XLT, 5-sp., AC, AM/FM, trailer hitch, 30K miles, 50K-mile warranty, \$9900. Volk, 299-7179.

- '83 RENAULT ALLIANCE L, AC, AM/FM, 5-sp., AT, 4-dr., tan, cruise, front-wheel drive, \$2895. Montoya, 883-9115.
- '69 PLYMOUTH VALIANT, slant-6, AT, new water pump, timing chain needs work, best offer. Amos, 298-1095.

REAL ESTATE

- 2-BDR. TOWNHOUSE, next to Health Spa in Los Lunas, garage, fenced backyard, \$64,000. Altwies, 865-1200 or 865-9453.
- 3-BDR. HOME, NE, 1-3/4 baths, double garage, mountain view, library on corner, \$74,900. Wenrich, 294-1006.
- 4-BDR. ADOBE HOME, Rio Rancho, 2 baths, brick floors, kiva fireplace, double garage, \$79,500. Andrews, 256-7328.
- 4-BDR. HOME, custom tri-level, NE, 3 baths, family room, new roof, paint, and some carpet. Brooks, 265-8612.
- 3-BDR. HOME, near Heritage Hills, 1-3/4 baths, LR, DR, FR w/breakfast bar, mountain views, \$96,500. Gregory, 821-2125.
- 3-BDR. HOME, 1100 sq. ft., new roof and paint, oak kitchen cabinets, FHA appraisal, near Coronado Center, \$64,000. Reinarts, 881-6135.
- 3 BDR. HOME, study recently remodeled including 400 sq. ft. quarry tile, auto sprinklers, near schools and Sandia bus. Carrigan, 821-5856.
- 14' X 70' MOBILE HOME, on half-acre in Peralta, garage/workshop w/utilities, deep well and 2 other wells, extras, \$46,000. Vigil, 869-6870.
- 3-BDR. TOWNHOME, near KAFB, 1460 sq. ft., 2-1/2 baths, carpeted, 2-car garage w/opener, enclosed yard, landscaped, no assn. fee, 7-3/4% assumable w/restrictions, \$68,000. Hogan, (415)422-3190 or (415)447-4860.

WANTED

- RADIO/45-rpm phonograph, small, for sickroom use. Smith, 255-5662.
- CONTACT with anyone who took a CREI correspondence course during the mid or late 70s. Meikle, 299-4640.
- PORTABLE TABLE LOOM, 4-harness, 18" or 24" wide. Gillon, 255-9162.
- CARDBOARD BOXES needed for moving, will pick up. Schuh, 822-9824.
- ROWING EXERCISE machine. Underhill, 881-0246 after 5.
- BOAT, lightweight aluminum, V-hull, rated for over 10-hp, 12' long. Holmes, 292-0898.
- FEMALE VACATION COMPANIONS to plan and travel w/2 other females, share expenses other than airfare. Johnson, 296-1917.
- OLD FARM TRACTOR or steam engine suitable for restoration, the older the better, any make. Marrs, 281-9889.
- STEREO TAPE noise-reduction unit, for connection to cassette deck. Lagasse, 293-0385.
- SUPPORT POLE for basketball backboard. Gallegos, 292-2059.
- 16-INCH RIMS, 6-hole pattern, normal width. Loucks, 281-9608.
- USED "NORDICTRACK" exerciser. Russell, 298-8879.
- PAIR OF ZEISS or Leitz compact binoculars. Montoya, 296-4268.
- BOOKS ON METAPHYSICS. Lucero, 296-2473.

Rally to Rhumba Rhythm — Tonight & on March 13

CALLING ALL LATIN LOVERS — Latin music lovers, that is. Your big opportunity is now! Freddie Chavez and group belt out those south-of-the-border tunes tonight from 8 p.m.-midnight, right after the two-for-one dinner special (filet mignon or snow crab, two dinners for \$14.95). Freddie and his crew, well known in these parts for their scintillating sambas and racy rhumbas, will return on Friday night, March 13, for another go-round. That night, you can feast on a \$7.95 buffet featuring baron of beef and fish, along with a full salad bar. Don't be latent on your Latin Night reservations — give the Club a call right now (265-6791).

MAYBE THOSE GNOMES gnow something we don't gnow. Find out when you show up at Family Night on March 7. The fun starts at 5 p.m., with a low-cost buffet loaded with stuff the whole family enjoys: pizza, hot dogs, etc. Pixie the clown entertains the troops from 5:30 to 6 with a magic show. Following Pixie's patter, the hilarious Disney classic, "Gnomemobiles," lights up the big screen. As usual, the movie is free.

MIDDAY SHUFFLE — Sounds like a new dance step, but it's really not. It's simply another description for the T-Bird card players' next get-together on March 5, starting at 10:30 a.m. These folks really have it together, whether it's bridge, poker, or what-have-you. Mostly, our spies tell us, it's just plain fun — so join the group for a good time, munchies, and gaming.

SPEAKING OF SHUFFLING, the next opportunity for sagebrush shufflers to come out of the closet is next Friday night, March 6. Everybody's favorites — those Poor Boys from Isleta — provide their good old country/western tunes from 8:30 p.m.-12:30 a.m. You can add another hour of dancing to that if you get in on the c/w lessons from 7:30-8:30. Stop in for dinner ahead of time; the two-for-one special headlines prime rib or fried shrimp, a toothsome twosome if there ever was one.

VCP SEMINAR, ROUND 2, is set for Monday, March 2, from 4:45-5:30 p.m. in the Eldorado room. Greg Zanetti of E. F. Hutton discusses tax implications of your Voluntary Contribution Plan distribution, IRA rollovers, and alternative plans acceptable under the new tax law. It's free and open to the public. More info from Greg on 265-5561.

GOT THE SUNDAY BLUES? You won't have them very long if you make a reservation for the next Sunday brunch on March 8, from 10 a.m.-2 p.m. Just take a look at that fine array of food, and your troubles fly right out the window! The matchless menu includes a BBQ entree, baron of beef, a vegetable, scrambled eggs, bacon, hash browns, green chile salsa, salad bar (including potato salad and macaroni salad), fruit juices, and desserts. The price for all that doesn't break you up, either — it's just \$5.95 for adults and half price for kids under 12.

ELECTION NIGHT EXTRAVAGANZA: At least that's the way the Coronado Schussers (Ski Club) are billing it. Next meeting is March 10 at 7 p.m. in the ballroom, and election of officers gets everybody's attention that night. Lots of free munchies available and — if we know this group like we think we do — there'll probably be some fantastic door prizes for a few of the luckier attendees.

The Ski Club's main event this weekend (Feb. 28-March 1) is Carnival 87 at Sandia Peak. It's fun for the whole family and features races, treasure hunts, and fabulous food. Get registered and be there!

Ski trips continue in March. (This enthusiastic

bunch would probably ski right through the summer if it could just find snow somewhere.) The schedule: Purgatory, March 6; and Banff (wow!), March 17.

THUNDERBIRD THRILLS — There's a day full of them on March 16, so mark your calendar right now. Start out at a nice civilized time of day (lucky retirees!) with lunch at 12:30 p.m. at the south end of the ballroom. Next, it's a program put together by those free-wheeling Road Runners (RV Club) to let you know what's in store for the summer. After the program, plan to attend the T-Bird Board of Directors meeting.

PACK UP YOUR TROUBLES in your old kit bag, or new suitcase, or something. And smile, smile, smile when you sign up for all those super sojourns put together by the C-Club Travel Committee.

Into Cherry Blossoms? If so, we have just the ticket for you: a trip to Washington, D.C., and Virginia right at cherry blossom time — April 4-11. Your Patriot's Pass in Williamsburg gives you access to films, exhibition buildings, galleries, etc., in that historic town. Also spend time in Richmond, Charlottesville (where you lunch at the famous Michie Tavern), and other interesting Virginia sites. A D.C. sightseeing tour includes many of the capital's monuments, the White House, and Capitol Hill. Another day, take time to explore the Smithsonian. Topping it all off is a front-row seat for the Cherry Blossom Festival Parade. The \$777/person tab covers RT air fare and charter bus for local transportation, guided tours, seven nights' lodging, admissions, baggage handling, and several fine meals.

How About Petrified Forests? As you know, there's one of those in our neighboring state to the west. A stop there is part of a trip to Sedona, Ariz., scheduled May 9-12. Besides petrified wood, you'll also see the Painted Desert, Montezuma Castle, Oak Creek Canyon, and Jerome State Historical Park. The low price of \$170/person (double) includes RT charter bus fare, two nights' lodging, all that sightseeing, and snacks and drinks on the bus.

Or Totem Poles? And spectacular scenery and stern-wheeler cruises and city tours of Anchorage and Fairbanks and a week-long luxury cruise aboard the *Regent Sea*. We could go on and on, but you get the idea. This cruise/land (or cruise only) Alaskan adventure has to be one of the biggies for 1987. The *Regent Sea* cruise includes stops at Ketchikan (home of those towering totem poles), Juneau, Skagway, and last — but certainly not least — Vancouver. The cruise/land option (Sept.8-20) includes all of the above, plus Mt. McKinley National Park and much more, for \$2325/person (double). Cruise-only types

(Sept. 13-20) pay \$1642. Triple or quad occupancy gives you a price break — the more, the merrier, right? Included are all transportation and transfers, all meals on the cruise, lodging along the way, and taxes/tips. What a way to go . . .

And Rivers Dyed Green? Because that's what happens in San Antonio, Tex., on St. Patrick's Day. And you'll be there to see it if you make a reservation for the SA trip, scheduled March 15-18. Yep, pardner, yawl'll bunk at the Menger Hotel, right close to the Alamo, and right up against the Riverwalk (might as well learn the lingo). There's a full day of sightseeing in San Antonio, as well as a foray into Texas hill country; the latter includes stops at the LBJ Ranch, Fredericksburg, and Kerrville (where you lunch at the Inn of the Hills). For \$421/person, you get RT air fare, three nights' lodging, and a couple of other special meals. And that St. Pat's celebration staged by the locals — well, you have to see it to believe it!



Here are a couple of current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (3163), on 4-3268.

HUGH O'BRIAN YOUTH FOUNDATION annually presents a seminar for New Mexico's outstanding high school sophomores that is designed to educate these potential leaders on the benefits and rewards of the American incentive system. A Sandian is Director of Counselors for the program this year, and is responsible for locating 20 counselors to supervise the 100 sophomores expected to participate. Requirements for counselors include an interest in being with young, energetic students and the ability to participate in the entire seminar (Friday, June 5 - Sunday, June 7, with an orientation on the evening of Thursday, June 4 — all at UNM).

VOLUNTEERS FOR THE OUTDOORS is looking for volunteers to help preserve petroglyphs on Albuquerque's West Mesa on Saturday, March 7, 9 a.m.-3 p.m. Guided walking tours led by experts on the petroglyphs will be available during the lunch-hour break.



VIA VOLUNTEER GLORIA WEBB (3144) reads *Harry the Dirty Dog* to Banelier Elementary School first-graders. Gloria used vacation time to participate in Albuquerque's community "Read-In" on Feb. 11. More than 350 volunteers representing 145 organizations and companies participated at 14 Albuquerque Public Schools.